

Response
Application No. 10/623,679
Attorney Docket No. 030891

REMARKS

(1) Claims 1-3 and 5-30 are pending in this application. No amendment has been made in this Response.

(2) Claims 1-3 and 5-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ishibashi et al. (U.S. Patent No. 6,579,657) in view of Forsberg et al. (U.S. Patent Nos. 4,661,275 and 4,749,500) or Markovich et al. (U.S. Patent No. 5,055,342).

(i) The Supreme Court reiterated the framework for objective analysis for determining obviousness stated in Graham v. John Deere Co., 383 U.S. 1 (1966). KSR International Co., v. Teleflex Inc., 127 S.Ct. 1727 (2007). The basic factual inquiries of *Graham* include resolving the level of ordinary skill in the art.

As argued in the previous Response, the author overlapping with the inventors of Ishibashi et al. (U.S. Patent No. 6,579,657) admits in June 2003 that the conventional RELACS™ material does not show satisfactory shrinkage on an ArF resist, and that as of June 2003, there had not existed any RELACS™ materials showing satisfactory shrinkage on an ArF resist. See “Below 70nm Contact Hole Pattern with RELACS Process on ArF Resist.” The author overlapping with the inventors of Ishibashi et al. (U.S. Patent No. 6,579,657) also stated in 2006 that a RELACS material specialized in thickening a KrF resist was not suitable for an

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ArF resist, and was trying to develop a new material applicable to an ArF resist. See “Newly Developed Resolution Enhancement Lithography Assisted by Chemical Shrink Process and Materials for Next-Generation Devices.”

These articles clearly show the level of the ordinary skill in the art at the time when the invention was made. Ishibashi et al. did not possess any resist pattern thickening material capable of thickening a resist pattern of ArF resist. The disclosure of “ArF” in Ishibashi et al. at col. 6, line 46 is not enabling as argued in the Applicants’ Response filed on July 6, 2007.

(ii) In the outstanding Office Action, the Examiner admits that Ishibashi et al. fail to specifically teach the instantly claimed non-ionic surfactants, but combines Ishibashi et al. with Forsberg et al. or Markovich et al. However, neither of Forsberg et al. nor Markovich et al. teach any resist pattern thickening material, which is different from Ishibashi et al. Although the Examiner states that Triton X-100, an octylphenol ethoxylate, is a “well known surfactant,” this statement does not provide any *prima facie* explanation that the Ishibashi’s composition could have been improved by the “well known” surfactant as taught by Forsberg et al. nor Markovich et al. The KSR court made clear that a finding of teaching, suggestion and motivation to combine is not a rigid rule that limits the obviousness inquiry, but “there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” Innogenetics N.V., v. Abbott Laboratories, 2008 WL 151080 (Fed. Cir. 2008); citing KSR 127

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S.Ct. 1727, 1741. There must be many other surfactants which are “well known” other than the surfactants taught by Forsberg et al. or Markovich et al. There is no motivation to choose the surfactants taught by Forsberg et al. or Markovich et al. among other surfactants. Forsberg et al. or Markovich et al. do not teach improving the thickening feature of a resist pattern. There references do not teach or suggest any resist pattern thickening material.

(iii) Moreover, the Examiner states “reasonable expectation of achieving a material for forming a fine pattern.” Page 4, lines 3-4 of the outstanding Office Action. However, Forsberg et al. or Markovich et al. do not teach improving the thickening feature of a resist pattern by the disclosed surfactant. The results and effects obtainable by the taught surfactant are unpredictable. It is unpredictable whether the Forsberg’s or Markovich’s surfactant taught in a different composition improves forming a fine pattern. KSR 127 S.Ct. 1727, 1731. Thus, there is no “reasonable expectation of achieving a material for forming a fine pattern.”

(iv) As supported by the statements in “Below 70nm Contact Hole Pattern with RELACS Process on ArF Resist” and “Newly Developed Resolution Enhancement Lithography Assisted by Chemical Shrink Process and Materials for Next-Generation Devices,” development of a resist pattern thickening material capable of thickening an ArF resist is a long-felt need at least as of 2003. The Ishibashi’s material could thicken a KrF resist pattern, but did not satisfactorily thicken an ArF resist. The modification of the Ishibashi’s material by the

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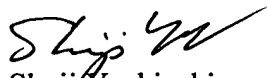
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Forsberg's or Markovich's non-ionic surfactant is not "technical grasp" of one skill in the art at the time the invention was made. KSR 127 S.Ct. 1727, 1742.

(3) In view of the remarks, Applicants submit that that the claims are not obvious over the cited references and in condition for allowance. Applicants request such action at an early date. If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned representative at the telephone number indicated below to arrange for an interview to expedite the disposition of this case. If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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Attachment: Limited Recognition
Petition for Extension of Time